



Anton Paar

Volatility

Oxidation Stability

Cold Flow Properties

Consistency and Ductility

Various Petroleum Properties

Master of Standards

Testing Instruments for the Hydrocarbon World.

ASTM D5 | ASTM D36 | ASTM D56 | ASTM D70 | ASTM D86 | ASTM D9
 ASTM D93-C | ASTM D97 | ASTM D103 | ASTM D130 | ASTM D217 | ASTM D2
 | ASTM D323-D | ASTM D324 | ASTM D524 | ASTM D525 | ASTM D850 |
 D937 | ASTM D943 | ASTM D1293 | ASTM D1319 | ASTM D13
 ASTM D1481 | ASTM D2174 | ASTM D2274 | ASTM D2500 | ASTM D3142 | A
 D3941 | ASTM D4310 | ASTM D4319 | ASTM D4953 | ASTM D5353 | ASTM D
 | ASTM D7342 | ASTM D7462 | ASTM D7525 | ASTM D7525 | ASTM E28 | DIN
 DIN 51755-1 | DIN 51757 | DIN 51784 | DIN 52004 | DIN 52113 | EN 116 | EN
 | EN 1871-F | EN 6246 | EN 12694 | EN 13179-1 | EN 13392 | EN 13398 | EN
 16329 | EN 23015 | EN ISO 2719 | FTM 791-201 | FTM 791-3352 | FTM 791-3354
 | FTM 791-354 | FTM 791-3703 | FTM 791-5002 | FTM 791-5002 | FTM 791-5002
 | IP 34-A | IP 34-B | IP 36 | IP 40 | IP 50 | IP 58 | IP 69-A | IP 69-C | IP 69-D | IP
 | IP 154 | IP 156 | IP 157 | IP 160 | IP 170 | IP 179 | IP 189 | IP 190 | IP 195 |
 376-A | IP 376-B | IP 388 | IP 441 | IP 491 | IP 492 | IP 515 | IP 516 | IP 520 | IP
 | ISO 2137 | ISO 2160 | ISO 2512 | ISO 2719-A | ISO 2719-B | ISO 3007-A | ISO
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 JIS K 2207 | JIS K 2220 | JIS K 2235 | JIS K 2249 | JIS K 2258 | JIS K 2261 | JIS K
 | JIS K 2276 | JIS K 2287 | JIS K 2288 | JIS K 2513 | JIS K 2514 | JIS K 2518 |
 T48 | AASHTO T51 | AASHTO T53 | AASHTO T300 | European Pharmacopoeia

Anton Paar Headquarters

Sales Subsidiaries

Sales Partners and Joint Ventures

Competence in Standardized Measurement

| | |
|---------------|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| ASTM | American Society for Testing and Materials |
| DIN | Deutsches Institut für Normung |
| EN | Comité Européen de Normalisation |
| EWG | Europäische Wirtschaftsgemeinschaft (European Economic Community [EEC]) |

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1996-15 | DIN 51579 | DIN 51587 |
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K 2265-3 | JIS K 2265-4 | JIS K 2269
JIS K 2536 | JIS K 2601 | AASHTO
beia 2.9.9. | GOST R EN ISO 2719

| | |
|-------------|--|
| FTM | Federal Test Method (US) |
| GOST | Gosudarstwenny Standard |
| IEC | International Electrotechnical Commission |
| IP | Institute of Petroleum Standards |
| ISO | International Standardization Organisation |
| JIS | Japanese Industrial Standards Committee |



Abel Flash Point Tester: ABA 4

The ABA 4 automatic closed-cup flash point tester with extended measuring range, Peltier cooling and stirrer measures the flash point, the lowest temperature at which the vapors of a sample might ignite, and the ability to yield flammable vapors at an equilibrium temperature.

ABA 4 is suitable for jet fuels, solvents, chemicals and more.

Specifications

Standard methods:

ISO 1516, ISO 1523, ISO 13736,
EN 924, DIN 51755-1, IP 170,
IP 491, IP 492

Application range:

with internal air cooling
10 °C to 110 °C (50 °F to 230 °F)

with external liquid cooling
-30 °C to 110 °C (-22 °F to 230 °F)

Optional:

PC software FPPNet



Tag Flash Point Tester: TAG 4

The TAG 4 automatic closed-cup flash point tester with extended measuring range and Peltier cooling measures the flash point, the lowest temperature at which the vapors of a sample might ignite, and the ability to yield flammable vapors at an equilibrium temperature.

TAG 4 is suitable for jet fuels, solvents, chemicals and more.

Standard methods:

ASTM D56, ASTM D3934,
ASTM D3941, ISO 1516, ISO 1523,
EN 924, FTM 791-1101,
IP 491, IP 492

Application range:

with internal air cooling
10 °C to 110 °C (50 °F to 230 °F)

with external liquid cooling
-30 °C to 110 °C (-22 °F to 230 °F)

Optional:

PC software FPPNet

Pensky-Martens Flash Point Tester: PMA 5

The PMA 5 automatic closed-cup flash point tester with integrated fire-extinguishing system measures the flash point, the lowest temperature at which the vapors of a sample ignite upon application of an ignition source.

PMA 5 is suitable for biodiesel and biodiesel-blended fuels, distillate fuels like diesel heating oil, kerosene and much more.

Standard methods:

ASTM D93-A, ASTM D93-B,
ASTM D93-C, ISO 2719-A,
ISO 2719-B, ISO 15267,
JIS K 2265-3, IP 34-A, IP 34-B,
GOST R EN ISO 2719

Application range:

up to 405 °C (761 °F)

Optional:

PC software FPPNet





Specifications

Standard methods:

ASTM D93-A, ASTM D93-B,
ASTM D93-C, ISO 2719-A,
ISO 2719-B, ISO 15267,
JIS K 2265-3, IP 34-A, IP 34-B

Application range:

up to 405 °C (761 °F)

Test places:

up to 12 test cups

Pensky-Martens Flash Point Tester with Sample Changer: PMA 4 SC

The PMA 4 SC automatic closed-cup flash point tester with sample changer and integrated fire-extinguishing system is an exceptionally time- and cost-saving alternative.

PC software FPPNet for convenient remote handling and test data storage is included.

PMA 4 SC is suitable for biodiesel and biodiesel-blended fuels, distillate fuels like diesel heating oil, kerosene and much more.

Cleveland Flash & Fire Point Tester: CLA 5

The CLA 5 automatic open-cup flash and fire point tester measures the flash point, which describes the tendency to form a flammable mixture with air, and the fire point, which indicates the tendency of sustained burning.

CLA 5 is suitable for lubricants, residual fuels or bituminous material.

Standard methods:

ASTM D92, ISO 2592, JIS K 2265-4,
AASHTO T48, FTM 791-1103, IP 36

Application range:

up to 400 °C (752 °F)

Optional:

- ▶ PC software FPPNet
- ▶ Bitumen accessories



Software for Flash Point Testers: FPPNet

The FPPNet software reads and evaluates test data as well as controlling the automatic flash point testers. The graphical display of the sample temperature, heater temperature and heating rate allows convenient real-time monitoring of the test progress. It simplifies duties like program editing, documentation, data export and software updates. The software is available in English and German.



Suitable for:

ABA 4
TAG 4
PMA 5
PMA 4 SC (included)
CLA 5

Abel Flash Point Tester: AB 5

The AB 5 semi-automatic closed-cup tester measures the flash point, the lowest temperature at which the vapors of a sample ignite upon the application of an ignition source.

AB 5 is suitable for jet fuels, solvents, chemicals and more.

Specifications

Standard methods:
ISO 13736, IP 170

Application range:
-18 °C to 71 °C (-0.4 °F to 160 °F)

Lowest achievable temperature:
-30 °C (-22 °F)
(dependent on cooling type)

Ignition type:
Gas



Pensky-Martens Flash Point Tester: PM 4

The PM 4 semi-automatic closed-cup tester measures the flash point at the lowest temperature at which the application of an ignition source causes the vapors of a sample to ignite.

PM 4 is suitable for biodiesel and biodiesel-blended fuels, distillate fuels like diesel heating oil, kerosene and much more.

Standard methods:
ASTM D93-A, ASTM D93-B,
ISO 2719-A, ISO 2719-B,
JIS K 2265-3, IP 34-A, IP 34-B,
EN ISO 2719

Application range:
up to 405 °C (761 °F)

Ignition type:
Gas and electric (interchangeable)

Cleveland Flash & Fire Point Tester: CL 5

The CL 5 semi-automatic open-cup tester measures and describes the properties of a sample in response to heat and a test flame under controlled conditions. The flash point is a measure of the tendency to form a flammable mixture with air while the fire point indicates the tendency of sustained burning.

CL 5 is suitable for lubricants, residual fuels or bituminous material.

Standard methods:
ASTM D92, ISO 2592, JIS K 2265-4,
AASHTO T48, FTM 791-1103, IP 36

Application range:
79 °C to 400 °C (174 °F to 752 °F)

Ignition type:
Gas





Specifications

Standard methods:

ASTM D86, ASTM D850,
ASTM D1078, ISO 3405,
IP 123, IP 195

Application range:

up to 450 °C (842 °F)

Distillation groups:

0 to 4, solvents

Additional features:

Extended temperature range
Automated fire-extinguishing system
Password protection

Automatic Distillation Unit: ADU 5

ADU 5 is the ideal solution for automatically performing high-precision atmospheric distillation tests to characterize the volatility of petrochemical products.

Mean, max and min value and the standard deviation for selected samples are calculated automatically. The extended range of application comprises automatic dry point detections for solvents, cetane index determinations, calculations of the driveability index and the preparation of bottom residue for EN ISO 10370.

Distillation Unit: DU 4

DU 4 is designed for examining the boiling range characteristics of petroleum products as well as aromatic hydrocarbons and other volatile organic liquids. Test kits for all listed standard methods are available.

Available options:

- ▶ Circulator for heating and cooling
- ▶ Full-view tempering jacket for measuring cylinder

Standard methods:

ASTM D86, ASTM D850,
ASTM D1078, ISO 3405,
IP 123, IP 195

Application range:

up to 400 °C (752 °F)

Distillation groups:

0 to 4, solvents (up to 400 °C)

Heating power:

1200 W



Standard methods:

ASTM D323-A, ASTM D323-C,
ASTM D323-D, ASTM D4953,
ISO 3007-A, ISO 3007-C,
ISO 3007-D, IP 69-A, IP 69-C,
IP 69-D, JIS K 2258

Pressure range:

0 bar to 8 bar (800 kPa)

Sample pressure:

below or above 1.8 bar (180 kPa)

Application temperature:

37.8 °C (100 °F)

Reid Vapor Pressure: RVP

The RVP tester is a modular system for the automatic vapor pressure determination of gasoline, volatile crude oil and other volatile petroleum products according to Reid.

It is composed of:

- ▶ Pressure vessels (single/double-valve)
- ▶ Digital manometers (PA-REID)
- ▶ Liquid bath (3 or 6 places)
- ▶ Digital thermostat

Oxidation Stability Tester: PetroOxy

PetroOxy, a patented Rapid Small Scale Oxidation Tester (RSSOT), initiates a very fast artificial aging process and provides a complete oxidation stability analysis of petroleum products automatically in a very short test time, with high precision and excellent reproducibility.

PetroOxy is suitable for the stability determination of liquid fuels (gasoline, diesel, biodiesel, FAME and blends).

Specifications

Standard methods:

ASTM D7525, ASTM D7545,
EN 16091, IP 595

Application range:

up to 200 °C (392 °F)

Pressure range:

up to 2000 kPa (typically 700 kPa)

Sample volume:

typically 5 mL

Test cell:

Gold-plated



Oxidation Stability Tester: RapidOxy

RapidOxy is a Rapid Small Scale Oxidation Tester that provides a complete oxidation stability analysis of various products automatically, including all volatile and non-volatile oxidation products.

RapidOxy is suitable for storage stability determination of vegetable oils and animal fats (e.g. margarine, butter, edible oils), foods (such as mayonnaise, sauce, cream, cheese, biscuits) and cosmetics (lip balm, hand cream, body lotion, etc.).

Standard methods:

based on ASTM D7525,
ASTM D7545, EN 16091, IP 595

Application range:

up to 200 °C (392 °F)

Pressure range:

up to 2000 kPa (typically 700 kPa)

Sample volume:

typically 5 mL

Test cell:

Stainless steel

Software for Oxidation Stability Analysis: OxyLogger

This software simplifies the reading and evaluating of test data as well as controlling of the automatic oxidation stability testers RapidOxy and PetroOxy.

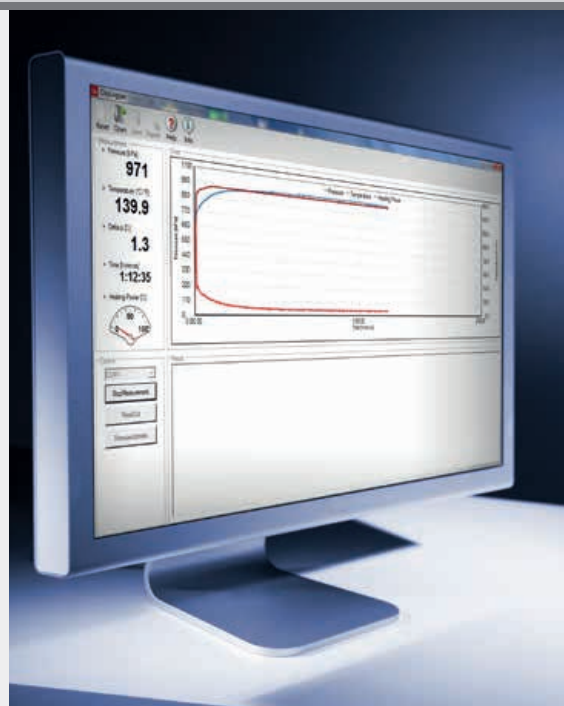
Sample pressure and temperature are graphically displayed in real time and after a successful test run the Induction Period (IP) is automatically calculated. The software features a viewer in which up to ten tests can be simultaneously compared.

Applications:

RapidOxy and PetroOxy

Induction Period (IP):

The time which passes between the moment when the measurement was started and the moment when the formation of oxidation products rapidly increases. This is indicated by a defined pressure drop.





Specifications

Standard methods:

ASTM D525, ASTM D873, ISO 7536,
JIS K 2276, JIS K 2287,
FTM 791-3352, FTM 791-3354,
IP 40, IP 138

Application range:

up to 200 °C (392 °F)

Pressure range:

up to 1400 kPa or 203 psi

Test places:

1 to 4

Oxidation Stability Tester: OBA 1

OBA 1 is used to determine the stability (induction period) and the tendency to form gum (potential residue) under accelerated oxidation conditions. The semi-automatic test arrangement features programmable PA 5-OBA manometers on stainless steel oxidation vessels in combination with a liquid bath or a dry heat bath.

OBA 1 is suitable for oxidation stability applications of gasoline and aviation fuel.

PA 5 Manometer and PetroNet Software for Oxidation Stability Analysis

The digital manometer PA 5 automatically records and displays the pressure, temperature and time for the oxidation stability tester OBA 1. Tests are monitored according to the programmed standard method.

The PetroNet software allows data acquisition during or after a test from the PA 5. Pressure and temperature curves can be displayed and results are automatically temperature-corrected. Customized test reports can be generated and data transfer to Excel is possible.

Application:

OBA 1

Standard methods:

ASTM D525, ASTM D873, ISO 7536

Application range:

up to 200 °C (392 °F)

Pressure range:

up to 1400 kPa or 203 psi

Resolution:

1 mbar/0.1 °C

Connections:

PC link/power cable
Pt1000 bath temperature sensor



Oxidation Stability Tester: TOST & TOO

The modular TOST & TOO tester is used to describe the properties of a sample in order to prevent oxidation and corrosion of metals.

The TOST & TOO bath in combination with standardized glassware sets and accessories is suitable for various mineral oils such as steam turbine and distillate fuel oils.

Standard methods:

ASTM D943, ASTM D2274,
ASTM D4310, ASTM D7462,
ISO 4263-1, ISO 4263-2, ISO 4263-3,
ISO 12205, JIS C 2101, JIS K 2514,
DIN 51587, FTM 791-5308, IP 157,
IP 388

Application range:

up to 175 °C (347 °F)

Test places:

1 to 4

Cold Filter Plugging Point Tester: Callisto 100

The fully automated and compact CFPP tester Callisto 100 comes with a newly developed state-of-the-art Peltier element concept which allows the connection of a methanol-free cooling system. It ensures outstanding homogeneity of the cooling jacket, which is the most critical and decisive parameter for a correct CFPP value determination.

Callisto 100 determines the low-temperature operability of diesel fuel, biodiesel, blends and gas oils.

Specifications

Standard methods:

ASTM D6371, EN 116, EN 16329, JIS K 2288, IP 309

Application range:

-60 °C to 25 °C (-76 °F to 77 °F)

Cooling profiles:

Programmable stepped or linear (from 6 °C/h to 100 °C/h)

Data memory:

1000 results
90 user-defined programs



Ease of Use of Callisto 100

Accurate detection:

Callisto 100 guarantees excellent detection and repeatability of test results, even when the pipette is frosted.

The contact-free infrared detection technology assures easy positioning of the complete filtration unit. This ensures accurate detection and excellent repeatability of test results.

High flexibility and efficiency

Callisto 100 has minimal downtime between two tests, which guarantees high throughput for maximized lab efficiency.

Extended cooling profiles

Besides the well-established stepped cooling method EN 116, Callisto 100 also provides the recently released linear cooling method according to EN 16329. The EN 16329 is now part of the EN 590 European diesel specification as an alternative test method to EN 116.

Cloud and Pour Point Tester: CAPP I

The CAPP I cloud and pour point tester is designed to determine the temperature at which a fuel starts to become cloudy or begins to precipitate paraffin (cloud point) and the lowest temperature at which a sample stops to flow (pour point). This manual CAPP tester features a 4-place refrigeration cabinet on castors equipped with glassware.

Suitable for all petroleum products, especially diesel fuel, biodiesel, blends, gas oils. Also for engine, turbine or insulating oil and paints.

Standard methods:

ASTM D97, ASTM D2500, ASTM D5853, ISO 3015, ISO 3016, EN 23015, JIS K 2269, JIS K 2601, FTM 791-201, IP 15, IP 219, IP 441

Application range:

-69 °C to 20 °C (-92 °F to 68 °F)

Cooling:

Air-cooled metal-block cryostat with one cooling chamber





Specifications

Standard methods:
depending on the accessories

Measuring range:
up to 80 mm (depending on plunger)

Maximum test load:
2000 g

Data storage:
200 measurements

Data conversion:
¼ and ½ cone to solid cone
NLGI and EN bitumen class

Penetrometer: PNR 12

The modular PNR 12 penetrometer automatically measures the resistance a material provides against being pierced by a specifically shaped penetrator such as a needle, cone, rod or disk. To assure a high flexibility in application you may choose between test kits for various standards and applications (bitumen, grease, wax, food, cosmetics or pharmaceuticals) or create your own set.

PNR 12 is suitable for consistency and plasticity determinations of pasty, creamy, semi-solid or highly viscous samples.

Needle and Ram Penetration

Typical applications with needles, rods and rams are hard or semi-solid samples.

- ▶ Petroleum industry: bituminous material, petroleum wax, paraffin, sealing mastic
- ▶ Pharmaceutical industry: dental plastic paste, gelatin and paraffin products, tablets/pills, firm creams
- ▶ Cosmetic industry: lotion, gel, cream, toothpaste, lipstick, mascara, soap
- ▶ Food industry: cheese, sweets, chocolate, confectionery, dough, yeast, marzipan, meat, sausage (hard), bread, vegetables, freeze-dried products
- ▶ Others: sealing mass, cement, plaster, gypsum, ceramic compounds, pigment paste, silicon products, etc.

Standard methods:

ASTM D5, ASTM D1321, ISO 6873, EN 1426, EN 13179-2, JIS K 2207, JIS K 2235, DIN 51579, IP 376-A, IP 376-B and more

Optional accessories:

- ▶ Test kits: sets acc. to standard requirements incl. needle, plunger, weight, sample container, etc.
- ▶ Plungers: manual or with automatic surface detection
- ▶ Needles: standard, tapered, pin, vicat, etc.
- ▶ Rods, rams, cylinders, cutters, balls, etc.
- ▶ Auxiliary equipment: cups, load weights, centering devices, plungers, etc.



Cone and Disk Penetration

Typical applications with cones or perforated disks are semi-solid or soft samples.

- ▶ Petroleum industry: lubricating grease, petrolatum
- ▶ Pharmaceutical industry: lotions, gel, ointment
- ▶ Cosmetic industry: lotion, gel, creamy or pasty products, toothpaste, petrolatum,
- ▶ Food industry: gelatin, curd, dough, edible fat (butter, margarine, lard), jelly, jam, honey, sweets, ketchup, mustard, mayonnaise, potato mash, pudding, pulp, sausage (soft), yeast, yogurt
- ▶ Others: sealants, paints and varnishes, glue, rubber solutions

Standard methods:

ASTM D217, ASTM D937, ASTM D1403, ASTM D7342, ISO 2137, IP 50, IP 179, IP 310, European Pharmacopoeia 2.9.9. and more

Optional accessories:

- Test kits: sets acc. to standard/sample requirements incl. cone, plunger, weight, sample container, etc.
- Cones and discs: full-, half-, quarter-, micro-, hollow-cones and discs
- Sample tempering units
- Micro grease worker

Grease Working Machine: GWM 5

The automatic grease-working machine is suitable for either single or double worker operation and simplifies the very exhausting working procedure required for shear stability sample preparation. Comparison between fresh unworked and worked samples or between penetration and other rheological test values indicates the shear stability of a material.

The grease worker is suitable for greases and other semi-solid materials.

Specifications

Standard methods:

ASTM D217, ASTM D7342,
ISO 2137, JIS K 2220,
FTM 791-313, IP 50

Speed:

60 strokes per minute

Counting:

preset six-digit stroke counter

Test places:

1 to 2



Softening Point Tester: RKA 5

The RKA 5 ring-and-ball softening point tester with its laser-based detection system automatically determines the temperature at which a substance attains a particular degree of softness. It is used for samples without sharply defined melting points, which become softer and less viscous as the temperature rises.

RKA 5 is suitable for bitumen, waxes, adhesives, resins, polymers, road-marking materials, sealing compounds, etc.

Standard methods:

ASTM D36, ASTM E28, ISO 4625-1,
EN 1238, EN 1427, EN 1871-F,
EN 13179-1, JIS K 2207,
AASHTO T53, DIN 1996-15, IP 58

Application range:

up to 250 °C (482 °F)

Ball dispensing:

Mechanical ball dispensing
Automatic electromagnetic ball
dispensing (optional)
Wilhelmi Method (optional)
EN 1871-F, DIN 1996-15

Automatic Ball Dispensing

The automatic ball-dispensing system is an upgrade to improve the process handling of the RKA 5.

This convenient and time-saving upgrade will release the test balls automatically after 15 minutes and is highly recommended for sample measurements above 80 °C.

The automatic ball-dispensing kit consists of a standard test rack and centering guides in combination with two electromagnetic holders.

Benefits:

- ▶ Easy ball attachment
- ▶ Software-controlled release
- ▶ Reduced working time

Typical release delay:

15 min





Specifications

Standard methods:
EN 12593, JIS K 2207, IP 80

Application range:
(depending on cooling circuit)
approx. -45 °C to 60 °C
(-49 °F to 140 °F)

Options:
BPACon software featuring
Permanent Bending Tests
and the Force Recovery Trend

BPM 5 melting apparatus

Fraass Breaking Point Tester: BPA 5

The BPA 5 automatic Fraass breaking point tester determines the brittle behavior of bitumen at low temperature. A thin flat steel plaque, coated with the sample, is flexed under specified conditions at a descending series of temperatures until a crack occurs.

BPA 5 is suitable for bitumen and in combination with the optional BPACon software it can also be used for other non-standardized research applications.

Digital Ductility Meter: DDA 3

The DDA 3 automatic ductility meter offers 3 simultaneous test places to measure the following bitumen properties:

Ductility or elongation is measured by the distance to which a sample will elongate before breaking.

Elastic recovery is measured by the recoverable strain determined after severing an elongated briquette specimen. Additive-containing bitumen will provide a significant elastomeric characteristic.

Force ductility measures tensile properties and the deformation energy.

Standard methods:
ASTM D113, ASTM D6084,
EN 13398, EN 13589, EN 13703,
JIS K 2207, AASHTO T51,
AASHTO T300, DIN 52013,
IP 515, IP 516, IP 520

Application range:
-10 °C to 60 °C (14 °F to 140 °F)

Travel length:
150 cm

Automatic rupture detection:
above 20 mN



Digital Ductility Meter: DD 3

The DD 3 semi-automatic ductility meter offers 3 simultaneous test places to measure the following bitumen properties:

Ductility or elongation is evaluated by the distance to which a sample will elongate before breaking.

Elastic recovery is defined by the recoverable strain determined after severing an elongated briquette specimen. Additive-containing bitumen will provide a significant elastomeric characteristic.

Standard methods:
ASTM D113, ASTM D6084,
EN 13398, JIS K 2207,
AASHTO T51, DIN 52013, IP 516

Application range:
-10 °C to 60 °C (14 °F to 140 °F)

Travel length:
150 cm



Density, API and Specific Gravity: Tempering Bath

This full-view borosilicate bath is, in combination with glassware for up to 4 test places, suitable for the determination of density, specific and API gravity.

Available accessories:

- ▶ Hydrometers: suitable for bitumen, oil and solvent tests
- ▶ Pycnometers (Lipkin, Gay-Lussac, Hubbard): suitable for bitumen and oil tests

Specifications

Standard methods:

(depending on the accessories)
ASTM D70, ASTM D287,
ASTM D1298, ASTM D1481,
ASTM D2111, ASTM D3142,
ISO 3675, ISO 3838, JIS K 2249,
DIN 51757, DIN 52004, IP 160,
IP 189, IP 190

Application range:

up to 150 °C (302 °F)

Bath volume:

20 liters



Gum Content Tester: GUM

Standard methods:

ASTM D381, ISO 6246, EN 6246,
JIS K 2261, DIN 51784,
FTM 791-3302, IP 131, IP 540

Application range:

with air and steam supply:
up to 260 °C (500 °F)
with air supply:
up to 246 °C (474 °F)

Sample volume:

50 mL per tube

The gum content tester helps to prevent induction-system difficulties by measuring the unevaporated residue of fuel that may lead to deposits and sticking intake valves. Featuring a multi-function head for simultaneous positioning of all 5 sample tubes increases accuracy and safety.

GUM is suitable for aircraft fuels, motor gasoline and other volatile distillates.

Options:

- ▶ GUM for tests with air or steam supply
- ▶ GUM for tests with air supply only

Fluorescent Indicator Adsorption Analyzer: FIA

The FIA fluorescent indicator adsorption analyzer determines the composition of liquid petroleum products by the amount of hydrocarbons. Knowing the total volume percent of saturates, olefins and aromatics in petroleum fractions is important for characterizing their quality as blending components for gasoline, motor and aviation fuels.

FIA is suitable for hydrocarbon mixtures with a boiling point below 315 °C.

Standard methods:

ASTM D1319, ISO 3837, JIS K 2536,
FTM 791-3703, IP 156

Test places:

4

Pressure gauges:

psi/bar double scale

Options:

Standard columns
Precision bore columns
UOP 501 standard column
UOP 311 precision bore column





Specifications

Standard methods:

ASTM D130, ASTM D4814,
ISO 2160, JIS K 2220, JIS K 2513,
FTM 791-5325, IP 154

Application range:

ambient to 200 °C (392 °F)

Bath volume:

20 liters

Test places:

6

Corrosiveness to Copper: Copper Strip Tester

The Copper Strip Tester is designed to assess the relative degree of corrosivity of a petroleum product due to its sulfur content. Depending on the accessories it can be used for copper or silver strip tests.

Pressure vessels are used for aviation gasoline, aviation turbine fuel and natural gasoline.

Test tubes are used for diesel fuel, fuel oil, automotive gasoline, cleaner's (Stoddard) solvent, kerosene, lubricating oil and other various petroleum products.

Ramsbottom Carbon Residue Tester: RCRT

The RCRT semi-automatic Ramsbottom carbon residue tester with its gas-free furnace indicates coke-forming properties by determining the amount of carbon residue left after evaporation and pyrolysis of a sample.

RCRT is applicable to relatively non-volatile petroleum products, which partially decompose on distillation at atmospheric pressure, like diesel fuel, motor oil, gas or crude oil.

Standard methods:

ASTM D524, ISO 4262,
FTM 791-5002, IP 14

Application range:

ambient to 760 °C (1400 °F)

Test places:

5



Salinometer: SCO 1

Standard methods:

ASTM D3230, JIS K 2601, IP 265

Application range:

up to 500 mg/kg
chloride in crude oil

Safety features:

Activation by two-hand use only

The SCO 1 salinometer uses the conductivity method to measure the approximate chloride (salt) concentration. The knowledge of the chloride concentration - in g/m^3 - gives information on the efficiency of the process desalter and provides a solid basis for assessing the need for crude oil desalting. The corrosion rates in refining units depend on the chloride concentration.

SCO 1 is suitable for crude oil.

Herschel Emulsifier: DH 5

The DH 5 Herschel emulsifier measures the ability of petroleum oils or synthetic fluids to separate from water.

The innovative stirring unit with auto-stop keeps a constant speed even with changing viscosities and can be easily rotated from test place to test place.

DH 5 is suitable for new or in-service oils which are subject to water contamination.

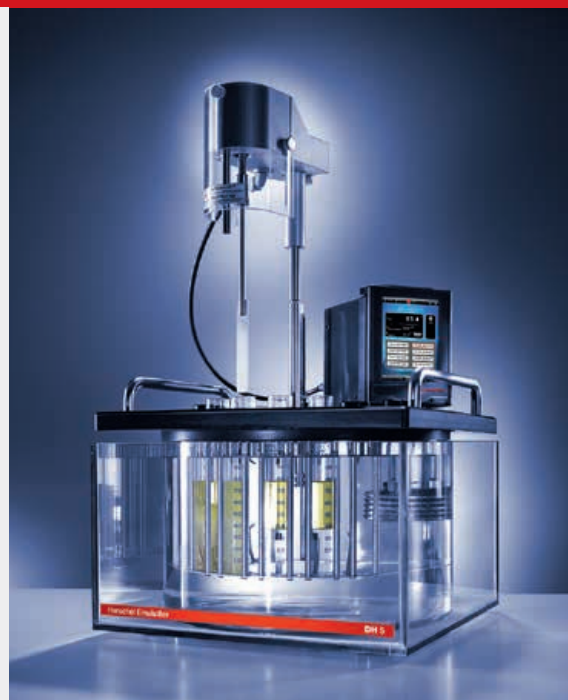
Specifications

Standard methods:
ASTM D1401, ISO 6614

Application range:
ambient to 85 °C (185 °F)

Speed control:
500 rpm to 1600 rpm

Test places:
1 to 8



One Device – Many Functionalities: DH 5

Safety features:
Protection cover around the stirrer
Overtemperature protection
Low-level protection
Safety cut-off when lifting stirrer

- ▶ Eight test positions for a fast sample throughput as different samples can be heated at the same time.
- ▶ Two extra positions for pre-tempering are available.
- ▶ Temperature and stirring speed are pre-defined but can also be easily set by touchscreen.
- ▶ The temperature stability of the bath is ± 0.1 °C.
- ▶ Automatic stirring stop after five minutes.

Foaming Characteristics: Foam Tester

The foam tester allows the determination of the foaming characteristics of lubricating oils at specific temperatures by empirically rating the foaming tendency and the foam stability. Especially in high-speed gearing and high-volume pumping systems, the tendency of oils to foam can lead to inadequate lubrication or cavitation, which may result in mechanical failure.

For a more convenient workflow the foam tester comprises two baths, in which the temperature can be individually maintained.

Standard methods:
ASTM D892 (sequence I - III),
ASTM D6082 (sequence IV),
ISO 6247, JIS K 2518, IP 146

Application range:
24 °C to 150 °C (75 °F to 302 °F)

Test places:
1 to 8

Optional:
Single bath arrangement





Selected products

Callisto 100, CAPP I,
RKA 5, BPA 5, DDA 3,
Tempering Bath

ABA 4, AB 5, TAG 4, PMA 5, PM 4,
PMA 4 SC, CLA 5, CL 5,
ADU 5, DU 4, RVP,
PetroOxy, OBA 1, TOST & TOO,
PNR 12,
Tempering Bath, GUM, FIA,
Copper Strip Tester, RCRT,
SCO 1, DH 5, Foam Tester

Petroleum and Chemicals

- ▶ **Measurement of the high- and low-temperature performance** of bitumen, crude oils, fuel oils, liquid fuels (automotive gasoline, jet fuel, diesel, biodiesel, ethanol, etc.), lubricants and solvents.
- ▶ **Quality control** of bitumen, crude oils, fuel oils, liquid fuels (automotive gasoline, jet fuel, diesel, biodiesel, ethanol, etc.), lubricants, waxes and solvents.

Food

- ▶ **Flammability tests** are required for the safe handling of liquid ingredients and help to define the classification of dangerous goods for transportation purposes.
- ▶ **Oxidation stability surveys** help to evaluate the possible shelf life of edible oils and dietary fats.
- ▶ **Consistency measurements** of liquid, pasty or solid samples help evaluate the ripeness of fruits, softness of cheese, etc., and give important information for transport, packing and storage.

ABA 4, AB 5, TAG 4,
PMA 5, PMA 4 SC, PM 4,
CLA 5, CL 5

RapidOxy

PNR 12
GWM 5
Tempering Bath



ABA 4, AB 5,
PMA 5, PMA 4 SC, PM 4

RapidOxy

PNR 12
GWM 5
Tempering Bath

Cosmetics and Pharmacy

- ▶ **Flammability tests** are required for the safe handling of alcohol-containing products like cleanser, fragrances, syrups, etc. and help to define the classification of dangerous goods for transportation purposes.
- ▶ **Oxidation stability determinations** evaluate the estimated shelf life of products containing pharmaceutical oil or grease like lotion, lipstick, etc.
- ▶ **Consistency measurements** give important information concerning the hardness of lipsticks, the spreadability of make-up, etc.

Glossary - References

| | | | | | | | |
|--|----|--|----|--|----|--|----|
| <u>AB 5</u> | 6 | <u>Copper Strip Tester</u> | 15 | <u>OBA 1</u> | 9 | <u>RCRT</u> | 15 |
| 107151 (230 V) | | 107156 (230 V) 106544 (115 V) | | 107052 (liquid, 230 V) 107053 (liquid, 115 V) 107054 (dry heat, 230 V) 107055 (dry heat, 115 V) | | 107327 (230 V) 107328 (115 V) | |
| <u>ABA 4</u> | 4 | <u>DD 3</u> | 13 | <u>PetroOxy</u> | 8 | <u>RKA 5</u> | 12 |
| 107097 (115 V/230 V, EU, internal Peltier cooling) 108319 (115 V/230 V, US, internal Peltier cooling) 107098 (115 V/230 V, EU, external cooling) 108320 (115 V/230 V, US, external cooling) | | 106177 (150 cm, 230 V) 108311 (150 cm, 115 V) | | 107131 (115 V/230 V, EU) 107132 (115 V/230 V, US) 107133 (115 V/230 V, EU, internal Peltier cooling) 107134 (115 V/230 V, US, internal Peltier cooling) | | 106209 (230 V, mechanical ball dispensing) 106210 (115 V, mechanical ball dispensing) 106212 (230 V, electromagnetic ball dispensing) 109476 (230 V, electromagnetic ball dispensing) | |
| <u>ADU 5</u> | 7 | <u>DDA 3</u> | 13 | <u>PM 4</u> | 6 | <u>RVP</u> | 7 |
| 145814 | | 106180 (150 cm, 230 V) 108312 (150 cm, 115 V) | | 107149 (230 V) 107150 (115 V) | | 106542 (230 V, 3 place bath) 113211 (230 V, 6 place bath) 130645 (115 V, 3 place bath) | |
| <u>BPA 5</u> | 13 | <u>DH 5</u> | 16 | <u>PMA 4 SC</u> | 5 | <u>SCO 1</u> | 15 |
| 106195 (230 V) 108313 (115 V) 106196 (with cooler, 230 V) 106197 (with cooler, 115 V) | | 106755 (230 V) 108373 (115 V) | | 107121 (115 V/230 V, EU) 108322 (115 V/230 V, US) | | 107129 (230 V) 107128 (115 V) | |
| <u>Callisto 100</u> | 10 | <u>DU 4</u> | 7 | <u>PMA 5</u> | 4 | <u>TAG 4</u> | 4 |
| 146618 | | 106509 (230 V, Eco+) 108315 (115 V, Eco+) | | 107125 (115 V/230 V, EU) 107126 (115 V/230 V, US) | | 107099 (115 V/230 V, EU, internal Peltier cooling) 107100 (115 V/230 V, US, internal Peltier cooling) 107101 (115 V/230 V, EU, external cooling) 108321 (115 V/230 V, US, external cooling) | |
| <u>CAPP I</u> | 10 | <u>FIA</u> | 14 | <u>PNR 12</u> | 11 | <u>Tempering Bath</u> | 14 |
| 106533 (230 V) | | 107158 (230 V) 107157 (115 V) | | 106813 (100 V to 240 V, EU) 106814 (100 V to 240 V, US) | | 106599 (230 V) 106600 (115 V) | |
| <u>CL 5</u> | 6 | <u>Foam Tester</u> | 16 | <u>RapidOxy</u> | 8 | <u>TOST & TOO</u> | 9 |
| 107152 (230 V) 107153 (115 V) | | 106571 (twin bath, 230 V) 108356 (twin bath, 115 V) | | 108338 (115 V/230 V, EU, internal Peltier cooling) 108339 (115 V/230 V, US, internal Peltier cooling) | | 106563 (230 V) 106564 (115 V) | |
| <u>CLA 5</u> | 5 | <u>GWM 5</u> | 12 | <u>GUM</u> | 14 | | |
| 107122 (115 V/230 V, EU) 107123 (115 V/230 V, US) | | 106763 (230 V) 106762 (115 V) | | 106537 (air and steam, 230 V) 106556 (air, 230 V) 106557 (air, 115 V) | | | |

Glossary - Standards

| ASTM | DIN | IP | ISO |
|------------------------------|-----------------------------|------------------------------|---------------------------------|
| ASTM D5 11 | DIN 1996-15 12 | IP 14 15 | ISO 3015 10 |
| ASTM D36 12 | DIN 51579 11 | IP 15 10 | ISO 3016 10 |
| ASTM D56 4 | DIN 51587 9 | IP 34-A. 4, 5, 6 | ISO 3405 7 |
| ASTM D70 14 | DIN 51755-1 4 | IP 34-B. 4, 5, 6 | ISO 3675 14 |
| ASTM D86 7 | DIN 51757 14 | IP 36 5, 6 | ISO 3837 14 |
| ASTM D92 5, 6 | DIN 51784 14 | IP 40 9 | ISO 3838 14 |
| ASTM D93-A 4, 5, 6 | DIN 52004 14 | IP 50 11, 12 | ISO 4262 15 |
| ASTM D93-B 4, 5, 6 | DIN 52013 13 | IP 58 12 | ISO 4263-1 9 |
| ASTM D93-C 4, 5 | | IP 69-A. 7 | ISO 4263-2 9 |
| ASTM D97 10 | | IP 69-C. 7 | ISO 4263-3 9 |
| ASTM D113 13 | | IP 69-D. 7 | ISO 4625-1 12 |
| ASTM D130 15 | EN | IP 80 13 | ISO 6246 14 |
| ASTM D217 11, 12 | | IP 123 7 | ISO 6247 16 |
| ASTM D287 14 | EN 116. 10 | IP 131 14 | ISO 6614 16 |
| ASTM D323-A 7 | EN 924. 4 | IP 138 9 | ISO 6873 11 |
| ASTM D323-C 7 | EN 1238. 12 | IP 146 16 | ISO 7536 9 |
| ASTM D323-D 7 | EN 1426. 11 | IP 154 15 | ISO 12205 9 |
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| ASTM D525 9 | EN 6246. 14 | IP 160 14 | |
| ASTM D850 7 | EN 12593. 13 | IP 170 4, 6 | |
| ASTM D873 9 | EN 13179-1 12 | IP 179 11 | |
| ASTM D892 16 | EN 13179-2 11 | IP 189 14 | |
| ASTM D937 11 | EN 13398. 13 | IP 190 14 | |
| ASTM D943 9 | EN 13589. 13 | IP 195 7 | JIS |
| ASTM D1078 7 | EN 13703. 13 | IP 219 10 | JIS C 2101 9 |
| ASTM D1298 14 | EN 16091. 8 | IP 265 15 | JIS K 2207 11, 12, 13 |
| ASTM D1319 14 | EN 16329. 10 | IP 309 10 | JIS K 2220 12, 15 |
| ASTM D1321 11 | EN 23015. 10 | IP 310 11 | JIS K 2235 11 |
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| ASTM D1403 11 | | IP 376-A. 11 | JIS K 2258 7 |
| ASTM D1481 14 | | IP 376-B. 11 | JIS K 2261 14 |
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| ASTM D2274 9 | FTM | IP 441 10 | JIS K 2265-4 5, 6 |
| ASTM D2500 10 | | IP 491 4 | JIS K 2269 10 |
| ASTM D3142 14 | FTM 791-201 10 | IP 492 4 | JIS K 2276 9 |
| ASTM D3230 15 | FTM 791-313. 12 | IP 515 13 | JIS K 2287 9 |
| ASTM D3934 4 | FTM 791-1101 4 | IP 516 13 | JIS K 2288 10 |
| ASTM D3941 4 | FTM 791-1103 5, 6 | IP 520 13 | JIS K 2513 15 |
| ASTM D4310 9 | FTM 791-3302 14 | IP 540 14 | JIS K 2514 9 |
| ASTM D4814 15 | FTM 791-3352 9 | IP 595 8 | JIS K 2518 16 |
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